

# Math 1022 College Trigonometry

## Fall 2009 Syllabus

### COURSE DESIGN

#### Class

- Class meets once a week for fifty minutes at the scheduled time. In class, your teacher will present an overview of the week's work.
- Attendance in class is required. If you must miss class and have a valid university excuse (death in the immediate family, severe personal illness, required military service, court-ordered appearance, etc.), contact your teacher immediately, preferably before the absence occurs.
- Video lectures for all sections are available. They can be accessed through the course assessment software *MyMathLab*. In addition, the videos can be accessed at [www.math.lsu.edu/courses/1022](http://www.math.lsu.edu/courses/1022). Select the Videos button from the left menu.
- Any student who misses the first day of class will be immediately dropped from the course. To re-enroll, go to the Pleasant Hall Math Lab.
- It is strongly recommended that you keep a notebook with all of your class notes and other work in it so that you can refer back to this whenever necessary.
- All cell phones, pagers, watches, and any other electronic devices that beep or ring must be turned off during class.
- You should keep track of your class attendance.

#### Lab

- The LSU Math Lab is located in Pleasant Hall. The main lab is on the first floor in Room 1155. The auxiliary lab is located in the basement in Room B155.
- Attendance in the lab for a minimum of three hours per week\* is required, but you should plan to spend at least five to six hours per week either in the lab or elsewhere in order to master the material. Teachers and tutors will be in the lab ready to provide you with immediate, personalized help.
- The lab will be open from 9 AM - 9 PM Monday - Thursday, 9 AM - 5 PM on Friday, and 5 PM - 9 PM on Sunday except on university holidays. Changes in the hours of operation will be posted in the lab.
- **You are allowed to do only your Math 1022 work or your math-related activities (such as scheduling a test or watching a math video) while you are in the lab.** The penalty for violating this rule will be a zero in lab participation for that week even if all required hours have been completed. Chronic violators will be turned over to the Dean of Students and dealt with appropriately, which may include being charged with a violation of the Code of Student Conduct and Academic Dishonesty.
- Cell phones are not allowed to be used in the lab.
- Laptops may not be used as an "ipod" when you are using lab computers.
- No food, drinks, water, gum, or candy is allowed in the lab.
- All cell phones, pagers, watches, and any other electronic devices that beep or ring must be turned off during lab.
- Note that 1:30 - 4:00 PM is the peak time in the lab Monday through Thursday, so there may be a waiting period during that time. If your schedule permits, plan to use the lab at another time.
- You should keep track of your own lab hours each week.
- It is strongly recommended that you bring your math notebook with you to lab. Do all of your work in it in an orderly manner and refer back to this work whenever necessary.
- Calculators with symbolic notation capabilities and graphing calculators are not recommended for lab use since they will not be allowed in the testing center.

\*Your lab week starts on the day your class meets each week and ends the next week on the day before the class meets. For example, if your class meets on Wednesday, then your lab week starts on Wednesday morning at 9 AM and ends on Tuesday of the next week at 9 PM. Some exceptions may be made to accommodate holidays.

### Participation Grade

- You will receive a participation grade at the end of the semester based on the percent of 1) weekly class meetings you participate in and 2) weekly three-hour per week\* lab minimum requirements you meet.
- Hours earned in one week over the minimum required hours do not “roll over” to the next week.
- There will be no partial credit for earning less than the minimum required lab hours in a week.

### MyMathLab

- All assessments are delivered on-line using software called *MyMathLab* published by Pearson Education. Exercises in *MyMathLab* are algorithmically generated iterations of textbook exercises.
- In order to register in *MyMathLab*, you will need three things. Bring these with you to the Pleasant Hall Math Lab.
  1. A **MyMathLab access code** which will come shrink-wrapped with your textbook that you purchase.
  2. Your **PAWS email address** which you must use in *MyMathLab* in order to receive credit for any work.
  3. The **correct course ID#** for the course and section you are registered in which will be given to you by your teacher at the first class meeting.
- If you have an existing *MyMathLab* account from the previous semester, you may not need a new access code. Try to enroll in the new course with the correct course ID number using your same login and password. If that fails, then you will need to buy a new access code and re-register in *MyMathLab*.
- For technical questions about *MyMathLab* outside of the Pleasant Hall Math Lab, call 1 800 677 6337.

### Homework

- You should study your class notes and the textbook before attempting the homework, and you should first try to do the homework exercises without using the help features. If you rely on the help features to get an exercise correct, be sure to rework a similar exercise until you can get it correct without any help. Many students who become overly dependent on the help features to get a score of 100% on the homework score much lower on the tests.
- The on-line homework assignments can be attempted an unlimited number of times prior to the due date.
- The grade on your last attempt will be recorded.
- Homework can be done from anywhere using *MyMathLab*, but the preferred location is the Pleasant Hall Math Lab.
- You are allowed to get help on homework, but the work submitted must be your own.
- Check your daily schedule for the exact date and time the homework is due for your particular class day meeting.
- Homework should be used as preparation for quizzes. Do the homework exercises repeatedly until you can do the work correctly without any assistance from tutors, notes, or software tutorials.
- At the end of the semester, the two homework assignments with the lowest grades will be dropped.

- Graded homework for each section has due dates and will close then, but the same homework assignment (labeled Practice Homework) is open throughout the semester to be used for studying.

## Quizzes

- You should master your homework before attempting the quizzes, and you should try to do the quizzes without any help. If you rely on help to get a score of 100% on the quizzes, you will score much lower on the tests.
- The on-line quizzes can be attempted up to ten times prior to the due date.
- It is recommended that you take a quiz at least four times even though you earn a score of 100% before that. This will insure that you see a cross-section of the exercises drawn from the exercise pools.
- Only your best quiz score for each quiz will be counted in your semester average.
- Quizzes can be taken from anywhere using *MyMathLab*, but the preferred location is the Pleasant Hall Math Lab.
- You are allowed to get help on quizzes, but the work submitted must be your own.
- Check your daily schedule for the exact date and time a quiz is due for your particular class day meeting.
- Quizzes should be used as preparation for tests. Take the quizzes until you can do the work correctly without any assistance from tutors, notes, or software tutorials.
- At the end of the semester, the two quizzes with the lowest grades will be dropped.

## Tests

- The proctored, password protected tests using *MyMathLab* must be taken at the Center for Assessment and Evaluation (CAE) Testing Center.
- Only one attempt is allowed for each test.
- You are not allowed assistance of any kind on a test. This includes notes, formula sheets, or any other type of outside help. While testing, you are not allowed access to other online materials, including your homework, quizzes, and online tutorials in MyMathLab. Note that the CAE Testing Center has strict policies regarding test-taking. Be sure to familiarize yourself with the rules. Remember, academic dishonesty is a violation of the university code of student conduct.
- **Calculators with symbolic notation, such as the TI-30XS Multiview, TI-34 Multiview, and the Casio 115ES, 300ES, ... Natural Textbook Display series, are not allowed on tests. Graphing calculators are not allowed on tests.**
- There is a window in which a test can be taken, and you may select the day and time to take your test as long as a seat is available. Check your daily schedule for the exact dates of your testing window. **You must schedule your test prior to the opening of the testing window to be guaranteed a seat in the testing center.** Use the CAE scheduler found at <http://www.cae.lsu.edu>.
- You will receive a confirmation email from CAE. **Print this email, and do not delete it.** Check the date and time to be sure you have recorded them properly. This email will serve as your receipt in case there is a problem when you arrive to begin your test.
- If you must miss a test for a valid reason, contact your teacher immediately, preferably before the testing window opens. Approved make-up tests will be given during the last two days of the semester.
- After completing all homework and quizzes, you should prepare for tests by repeatedly studying until you can get all exercises correct without any assistance from software tutorials, notes, or tutors.
- No tests will be dropped, but if your final exam grade is higher than your lowest test grade, your lowest test grade will be replaced with your final exam grade.
- Graded tests are inaccessible except in the testing center, but a similar version of each test (labeled Practice Test) is open throughout the semester to be used for studying.

## Final Exam

- The final exam is cumulative and tests all of the topics covered throughout the semester.
- The final exam is a proctored, password protected exam using *MyMathLab* and must be taken at the Center for Assessment and Evaluation (CAE) Testing Center during final exam week.
- Only one attempt is allowed for each test.
- You are not allowed assistance of any kind on a test. This includes notes, formula sheets, or any other type of outside help. While testing, you are not allowed access to other online materials including your homework, quizzes, and online tutorials in MyMathLab. Note that the CAE Testing Center has strict policies regarding test-taking. Be sure to familiarize yourself with the rules. Remember, academic dishonesty is a violation of the university code of student conduct.
- **Calculators with symbolic notation, such as the TI-30XS Multiview, TI-34 Multiview, and the Casio 115ES, 300ES, ... Natural Textbook Display series, are not allowed on tests. Graphing calculators are not allowed on tests.**
- There is a window in which the exam can be taken, and you may select the day and time to take your test as long as a seat is available. **You must schedule your test prior to the opening of the testing window to be guaranteed a seat in the testing center.** Use the CAE scheduler found at <http://www.cae.lsu.edu>.
- You will receive a confirmation email from CAE. **Print this email, and do not delete it.** Check the date and time to be sure you have recorded them properly. This email will serve as your receipt in case there is a problem when you arrive to begin your test.
- If you must miss the final exam for a valid reason, contact your teacher immediately, preferably before the testing window closes.
- Your final exam grade will not be dropped or replaced. If it is higher than your lowest test grade, then your lowest test grade will be replaced with your final exam grade.
- The Final Exam is inaccessible except in the testing center, but a similar version of it (labeled Practice Final Exam) is open throughout the semester to be used for studying.

## STUDENT MATERIALS

### Required

- The paperback, spiral bound textbook *College Algebra & Trigonometry*, 8<sup>th</sup> edition by Sullivan which includes a *MyMathLab* access code (ISBN 013 615 3577) is required.
- Your LSU student ID card is required for access to the Pleasant Hall Math Lab and the CAE Testing Center.
- A non-graphing calculator with logarithmic and exponential capabilities and a two-line display, preferably the TI-30XIIS (solar) or the TI-30XIIB (battery), is required. **Calculators with symbolic notation, such as the TI-30XS Multiview, TI-34 Multiview, and the Casio 115ES, 300ES, ... Natural Textbook Display series, are NOT allowed on tests. Graphing calculators are NOT allowed on tests.** Calculators with symbolic notation capabilities and graphing calculators are not recommended for lab use since they will not be allowed in the testing center.

### Recommended

- Headphones to listen to the video lectures in the Pleasant Hall Math Lab are recommended.
- Your tiger card with money to print in the Pleasant Hall Math Lab (5 cents per page) is recommended.

## **GRADE CALCULATION**

### **Final Grade:**

<i>Weight</i>	<i>Item</i>	<i>Details</i>
10%	Participation	5% for class participation and 5% for lab hours required
10%	Homework	lowest 2 of 21 homework scores will be dropped
10%	Quizzes	lowest 2 of 13 quiz scores will be dropped
45%	Tests	4 tests, lowest will be replaced with exam score if higher
25%	Final Exam	departmental, group, and cumulative

**Grading Scale:** A = 90-100%   B = 80-89%   C = 70-79%   D = 60-69%   F = 0-59%

## **GENERAL COURSE INFORMATION**

**Course Web Site:** <http://www.math.lsu.edu/courses/1022>

**Announcements:** Announcements throughout the semester will be made in class, through the *MyMathLab* announcement page, and by LSU e-mail. You are expected to check the *MyMathLab* announcement page and your LSU e-mail daily.

**Course Coordinator:** Ms. Karla Neal, 228 Lockett Hall, kneal1@lsu.edu, 225 578-2658

**Course Credit:** This course can be used to meet three credit hours toward the general education requirement for analytical reasoning. (See the LSU general catalog for more information.) This course is a General Education course in the analytical reasoning area because it includes the following area learning objectives:

1. Demonstrate an understanding and ability to apply trigonometry (including algebra and/or geometry) for computational problems in theoretical and real world situations.
2. Demonstrate the ability to interpret, make appropriate judgments, and draw logical conclusions based on quantitative information.
3. Demonstrate the ability to translate problem situations into symbolic representations and use those representations to solve problems.

Note that credit will not be given for both Math 1022 and Math 1023.

# College Trigonometry Content Topics and Objectives

## Angles and Their Measure

- Convert between Decimals and Degrees, Minutes, Seconds Forms for Angles
- Find the Arc Length of a Circle
- Convert from Degrees to Radians and from Radians to Degrees
- Find the Area of a Sector of a Circle

## Right Triangle Trigonometry

- Find the Values of Trigonometric Functions of Acute Angles
- Use the Fundamental Identities
- Find the Values of the Remaining Trigonometric Functions, Given the Value of One of Them
- Use the Complementary Angle Theorem

## Computing the Values of Trigonometric Functions of Acute Angles

- Find the Exact Values of the Trigonometric Functions of  $\frac{\pi}{4} = 45^\circ$
- Find the Exact Values of the Trigonometric Functions of  $\frac{\pi}{6} = 30^\circ$  and  $\frac{\pi}{3} = 60^\circ$
- Use a Calculator to Approximate the Values of the Trigonometric Functions of Acute Angles
- Model and Solve Applied Problems Involving Right Triangles

## Trigonometric Functions of General Angles

- Find the Exact Values of Trigonometric Functions for General Angles
- Use Coterminal Angles to Find the Exact Value of Trigonometric Functions
- Determine the Signs of the Trigonometric Functions of an Angle in a Given Quadrant
- Find the Reference Angle of a General Angle
- Use a Reference Angle to Find the Exact Value of a Trigonometric Function
- Find the Exact Values of Trigonometric Functions of an Angle, Given Information about the Functions

## Unit Circle Approach; Properties of the Trigonometric Functions

- Find the Exact Values of the Trigonometric Functions Using the Unit Circle
- Know the Domain and Range of the Trigonometric Functions
- Use the Periodic Properties to Find the Exact Values of the Trigonometric Functions
- Use Even-Odd Properties to Find the Exact Values of the Trigonometric Functions

## Graphs of the Sine and Cosine Functions

- Graph Functions of the Form  $y = A \sin \omega x$  Using Transformations
- Graph Functions of the Form  $y = A \cos \omega x$  Using Transformations
- Determine the Amplitude and Period of Sinusoidal Functions
- Graph Sinusoidal Functions Using Key Points
- Find an Equation for a Sinusoidal Graph

## Graphs of the Tangent, Cotangent, Cosecant, and Secant Functions

- Graph Functions of the Form  $y = A \tan \omega x + B$  and  $y = A \cot \omega x + B$
- Graph Functions of the Form  $y = A \csc \omega x + B$  and  $y = A \sec \omega x + B$

## Phase Shift

- Graph Sinusoidal Functions of the Form  $y = A \sin \omega x - \phi + B$

## The Inverse Sine, Cosine, and Tangent Functions

- Find the Exact Value of Inverse Sine, Cosine, and Tangent Functions
- Find an Approximate Value of Inverse Sine, Cosine, and Tangent Functions

- Use Properties of Inverse Functions to Find Exact Values of Certain Composite Functions

### The Inverse Trigonometric Functions (Continued)

- Find the Exact Value of Expressions Involving the Inverse Sine, Cosine, and Tangent Functions

### Trigonometric Identities

- Use Algebra to Simplify Trigonometric Expressions
- Establish Identities

### Sum and Difference Formulas

- Use Sum and Difference Formulas to Find Exact Values
- Use Sum and Difference Formulas to Establish Identities
- Use Sum and Difference Formulas Involving Inverse Trigonometric Functions

### Double-angle and Half-angle Formulas

- Use Double-angle Formulas to Find Exact Values
- Use Double-angle Formulas to Establish Identities
- Use Half-angle Formulas to Find Exact Values

### Trigonometric Equations (I)

- Solve Equations Involving a Single Trigonometric Function

### Trigonometric Equations (II)

- Solve Trigonometric Equations Quadratic in Form
- Solve Trigonometric Equations Using Identities
- Solve Trigonometric Equations Linear in Sine and Cosine

### Applications Involving Right Triangles

- Solve Right Triangles
- Solve Applied Problems

### The Law of Sines

- Solve SAA or ASA Triangles
- Solve SSA Triangles
- Solve Applied Problems

### The Law of Cosines

- Solve SAS Triangles
- Solve SSS Triangles
- Solve Applied Problems

### Area of a Triangle

- Find the Area of SAS Triangles
- Find the Area of SSS Triangles

### Polar Coordinates

- Plot Points Using Polar Coordinates
- Convert from Polar Coordinates to Rectangular Coordinates
- Convert from Rectangular Coordinates to Polar Coordinates
- Transform Equations from Polar to Rectangular Form

### Polar Equations and Graphs

- Graph and Identify Polar Equations by Converting to Rectangular Equations
- Test Polar Equations for Symmetry
- Graph Polar Equations by Plotting Points

### Vectors

- Graph Vectors
- Find a Position Vector
- Add and Subtract Vectors Algebraically
- Find a Scalar Multiple and the Magnitude of a Vector

- Find a Unit Vector
- Find a Vector from Its Direction and Magnitude

\*\*\*\*\*End of Syllabus\*\*\*\*\*

Math 1022 is a prerequisite for Math 1550 (Calculus I) and for courses outside the Department of Mathematics such as Physics 2001. Recent enrollment in this course has been around 1200 each semester.

## GENERAL EDUCATION OBJECTIVES

Math 1022 includes the following General Education learning objectives:

1. Understanding and applying trigonometry for computational problems in theoretical and real world situations;
2. Interpreting, making appropriate judgments, and drawing logical conclusions based on quantitative information;
3. Translating problem situations into symbolic representations and using those representations to solve problems;

These objectives are assessed using lab assignments, quizzes, and exams.

Virtually 100% of the work in this course pertains to Objective #1. Approximately 75% of the work pertains to Objective #2. Approximately 25% of the work corresponds to Objective #3. Of course, there is significant overlap among these objectives.

## ASSESSMENT

The course is divided into 22 topics, and these topics are subdivided into a total of 69 objectives. All 69 objectives are assessed in the homework exercises, and more than 90% of these objectives are assessed on the quizzes or the tests. The validity of these assessments in *MyMathLab* is assured by the fact that exercises on all of these assessments are drawn from a pool of algorithmically generated iterations of textbook exercises. The topics and objectives in a College Trigonometry course are very uniform throughout the country, and assessments in our course are very similar to assessments in a College Trigonometry course anywhere.